Structure : Silicon Monolithic Integrated Circuit

Product : Stereo pre-amplifire with mute detection circuits for car audio systems

Type : **BA3430FS**

Function :
1. Compact configuration of between music cassette tape forwarding function and preamplifier
2. Built in control logic, each mode selectable with microcomputer control
3. Compatible with auto reversing of normal and metal tapes

Absolute Maximum Ratings (Ta=25℃)

	Symbol	Rating	Unit
Power Supply voltage	Vcc	18	V
Power dissipation	Pd	800*	mW
Operating temperature	Topr	−30～+85	℃
Storage temperature	Tastg	−55～+125	℃

※This value decreases 8.0 mW/℃ for Ta=25℃ or more.
A standard board, 70 × 70 × 1.6 mm, shall be mounted.

Operating Voltage Range

Symbol	Range	Unit
Vcc	7.0～18.0	V

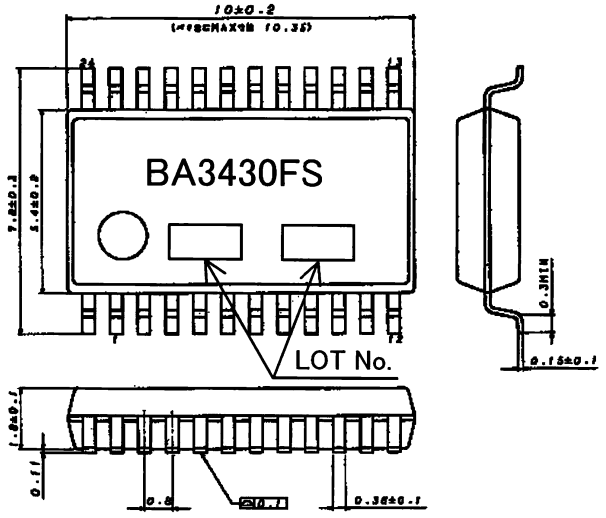
(Basic operation shall be available upon Ta=25℃.)

Application example

Electrical Characteristics
(Unless specified particularly, Ta=25℃, Vcc=9V, f=1KHz, Rg=600Ω, Vo=-10dBV)

Parameter	Symbol	Limit			Unit	Conditions
		Min.	Typ.	Max.		
Circuit current	I_{CC}	—	10.3	16	mA	No signal
Open loop voltage gain	G_{VO}	72	85	—	dB	
Closed loop voltage gain 1	G_{VC1}	37	40	43	dB	
Closed loop voltage gain 2	G_{VC2}	29	32	35	dB	f=10kHz,during metal playback
Maximum output voltage	V_{OM}	0.5	0.9	—	V_{rms}	THD=1%
Total harmonic distortion ratio	THD	—	0.05	0.2	%	
Input conversion noise voltage	V_{NIN}	—	0.7	1.5	μV_{rms}	20～20kHz BPF
Ripple rejection ratio	RR	40	50	—	dB	V_{RR}=－20dBV、f_{RR}=100Hz
A-B Cross-talk level	CT	55	65	—	dB	
Channel separation	CS	55	65	—	dB	
Mute level	ML	55	70	—	dB	
Song detection input level1	V_{ON1}	-96.5	-93.5	-90.5	dBV	f=5kHz,during playback
Song detection input level 2	V_{ON2}	-84	-81	-78	dBV	f=10kHz, during fast-forward
Song detection time	τ_1	—	6	—	ms	
Mute detection input level	τ_2	—	45	—	ms	
Logic low output sink current	I_{OL}	2	4	—	mA	
Logic high output leekage current	I_{OH}	—	1	3	μA	
Logic input low level voltage	V_{IL}	—	—	0.2	V	
Logic input high level voltage	V_{IH}	4.7	—	—	V	
Control pin outflow current	I_{IL}	—	—	200	μA	V_{IL}=0V
Control pin inflow current	I_{IH}	—	—	300	μA	V_{IL}=5V

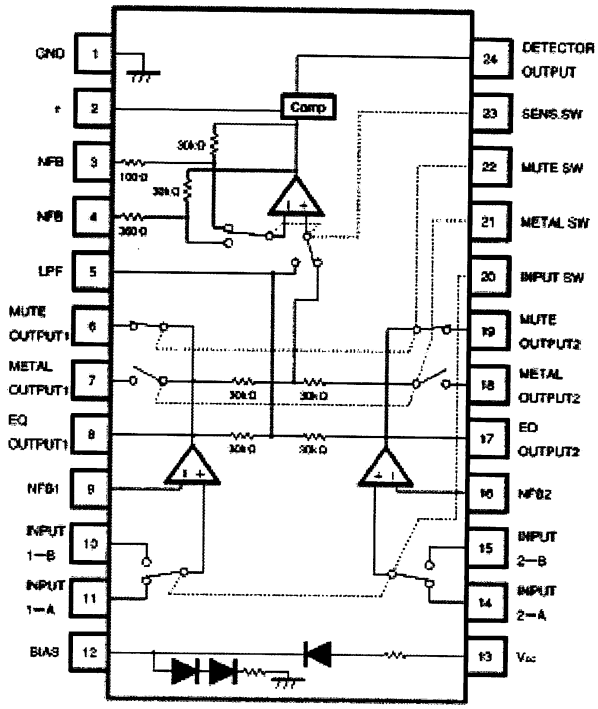
Outline Dimension



SSOP-A24 (Unit:mm)

Rev.B

Block Diagram



Terminal Number/ Terminal Name

Terminal Number	Terminal Name	Terminal Number	Terminal Name
1	GND	13	Vcc
2	τ	14	INPUT 2-A
3	NFB	15	INPUT 2-B
4	NFB	16	NFB2
5	LPF	17	EQ OUTPUT2
6	MUTE OUTPUT1	18	METAL OUTPUT2
7	METAL OUTPUT1	19	MUTE OUTPUT2
8	EQ OUTPUT1	20	INPUT SW
9	NFB1	21	METAL SW
10	INPUT 1-B	22	MUTE SW
11	INPUT 1-A	23	SENS SW
12	BIAS	24	DETECTOR OUTPUT

Application example

(1) Numbers and data in entries are representative design values and are not guaranteed values of the items.

(2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.

(3) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.

(4) GND potential
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.

(5) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.

(6) Shorts between pins and misinstallation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.

(7) Operation in strong magnetic fields
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

(8) Resister of each switching terminal
To prevent the malfunction of switching terminal, set the resister value of 3k–10kΩ for 20 and 23 pins, and 2k–22kΩ for 21 and 22 pin.

(9) Condensers for each switching terminal
The condensers of 20 pin and 23 pin are designed for malfunction prevention of the detection circuit between the music. Without these condensers, the between music detection output terminal (24pin) becomes low due to no signal caused by the pop sound generated when internal switch is activated. This malfunction continues during the between music detection time. By making the time for the between music detection shorter, this malfunction can be permitted to omit condensers. The condensers of 21pin and 22 pin are for pop sound prevention for voice signal. When the mute function is used at the latter part of setting to shut off the pup sound, the condensers can be omitted. This omission will not cause the malfunction of between music detection circuits.

(10) Music presence detection input level can be set by the resister of 3 pin and 4 pin. As the smaller this resister value the larger, the amplifier gain is, the music detection input level is smaller. Music presence detection input level of applicable circuit is set at – 93.5dBV (5kHz) for reproduction, and at −81dBV(10kHz) for fast forwarding

(11) Frequency characteristics for amplifier frequency characteristic reproduction when sensitivity is switched can be set by the C of 3pin, low range cut-off frequency by time constant of R can be set. The frequency characteristics for fast forwarding can be set by the C of 4pin, low range cut-off frequency by time constant of R can be set

(12) Music Detection Time
The music detection time setting is done with the 2 pin condenser. If this time is too short, short noise signal will activate the between music detection circuit, and it should be set longer as much as possible.

(13) Between Music Detection Time
Between music detection time is proportional to the product of power voltage and 2 pin condenser and 2 pin resister. Set the resister value at more than 22kΩ in consideration of allowable current of IC.

	20pinC		21pinC		22pinC		23pinC	
	Yes	No	Yes	No	Yes	No	Yes	No
Pop sound in audio signal	△	×	○	△	○	×	○	○
Mute detection circuit error	○	×	○	○	○	○	○	*

×··· Occurs

○··· Not occurs

△··· May occur due to gain in following stage

*··· Possibly of incorrect operation

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